REMARKS

This Amendment and Remarks are submitted in response to the Office Action dated August 8, 2006, wherein all pending claims in the application were rejected.

In view of Examiner's multiple rejections under 35 U.S.C. 112, first and second paragraph, Applicants redrafted claims as new claims 43-62 taking in consideration Examiner's rejections.

New Claims and Support in the Specification

The independent claim 42 is directed to an immature hyaline cartilage (neo-cartilage) construct.

The concept of the neo-cartilage is disclosed throughout the specification, particularly on page 17, lines 1-8, page 22, lines 3-9.

The term neo-cartilage is defined in the definition, page 12, line 1-3, and on page 22, line 3-9, as "an immature hyaline cartilage wherein the ratio of extracellular matrix to chondrocytes is lower than in mature hyaline cartilage".

The ratio of extracellular matrix to chondrocytes in mature hyaline cartilage is 95:5% of the matrix to the chondrocytes. This ratio is disclosed on page 22, lines 6 and 7.

Inactive mature non-dividing chondrocytes are disclosed on page 20, lines 20-22 and on page 22, lines 10-22.

Isolation of chondrocytes from cartilage4 is supported on page 23, lines 10-29.

Suspension of chondrocytes in the suspension solution and their seeding within support matrix is disclosed on page 19, lines 35-37, page 20, lines 1-2, page 24, section (c), lines 30-37 and on pages 25 and 26.

Metabolic activation of chondrocytes to synthesize the new extracellular matrix within support matrix using a treatment regimen including a perfusion with a perfusion medium at a flow rate from about 1 to about 500 µL per minute (page 36, lines 7-14) under a cyclic or constant hydrostatic pressure (page 36, lines 28-31) from about 0.01 MPa to about 10 MPa above atmospheric pressure (page 36, lines 31-35), at frequency of about 0.01 to about 1 Hz (page 36,

line 35), the time for applying the hydrostatic pressure followed by a resting period at an atmospheric pressure is from about one hour to about ninety days (page 50, lines 4-5, lines), hydrostatic pressure is applied from about 1 hour to about 30 days (page 36, lines 36-37) followed by a resting period from about 1 day to about 60 days, disclosed on page 37, lines 1-4).

Claim 44 is supported on page 23, lines 7-28.

Claim 45 is supported on page 1, lines 22-23, and page 50 lines 15-21.

Claim 46 is supported on page 11, lines 13-14 and on page 22, lines 28-37.

Claim 47 is supported on page 11, lines 15-19 and on page 22, lines 28-37.

Claim 48 is supported on page 24, lines 30-37.

Claim 49 is supported on page 25, lines 15-27.

Claim 50 is supported on page 25, lines 22-23.

Claim 51 is supported on page 11, lines 20-24, 32-33, page 29, lines 32-37, page 29, section (a), and page 30, section (b).

Claim 52 is supported on page 11, lines 23-31 and page 28, lines 19-31.

Claim 53 is supported on page 25, lines 15-23.

Claim 54 is supported on page 26, lines 8-21 and page 31, lines 1-26.

Claim 55 is supported on page 38, line 21 and page 49, line 33.

Claim 56 is supported on page 40, line 10.

Claim 57 is supported on page 37, line 19-22.

Claim 58 is supported on page 37, line 29.

Claim 59 is supported on page 29, line 11.

Claim 60 is supported on page 29, line 12.

Claim 61 is supported on page 36, lines 9 for the flow and page 80, lines 16-18 for insulin.

Claim 62 is supported on page 36, line 10.

The references to the support of individual claims given herein are only representative. Many other instances of the support language for the currently submitted claims can be found in the

specification, particularly in the experimental section.

Rejections Under 35 USC § 112, First Paragraph

Claims 21-42 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Examiner argues that the specification fails to disclose in claims 21 and 32 ranges of "about 1 hour to about 24 hours", "about 1 to about 90 days", "about zero to about 20%" for oxygen concentration, and "about zero to about 5%" for carbon dioxide concentration.

Examiner further argued that the specification additionally fails to disclose ranges of "about one to about 28 days" (claim 29) "zero to about 500 $\mu$/min" for perfusion (claim 32), and "below 3 to about 12 millions/mL" (claim 33). In the penultimate line of claims 22 and 34, the specification fails to disclose "a gel" as an alternative to the other materials claimed.

Applicants disagree. However, to meet Examiner's rejections, claims 21-42 are canceled. Replacement claims 43-62 are redrafted to correspond to ranges given in the specification. Applicants provide the information on the supporting language appearing in the specification for the new claims in the above section.

Examiner also questions the penultimate line of claims 22 and 34, in the specification, as failing to disclose "a gel" as an alternative to the other materials claimed. Applicants disagree with Examiner that "the gel" as an alternative is not disclosed in the specification, however, for the sake of advancing the examination, Applicants use the exact term for material used as a support matrix, namely the collagen gel, disclosed in the specification on page 38, lines 18 and 32.

In claim 36, the specification does not disclose a porous scaffold or honeycomb as an alternative to a sponge resulting from being freeze-dried or lyophilized.

Claim 36 is canceled.

Examiner further argues that the specification fails to disclose composite combinations as required by claims 23 and 38. Applicants disagree and maintain that such combinations are disclosed throughout the specification, however, to meet Examiner's rejections, Applicants canceled 23 and 38.

It is believed that the newly submitted claims obviate the rejections under 35 U.S.C. 112, first paragraph, and the rejections should thus be withdrawn. It is so respectfully requested.

Rejections Under 35 USC § 112, Second Paragraph

Claims 21-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failillg to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are confusing and unclear by defining the neo-cartilage construct in terms of process steps used in its preparation, and not setting forth clear, distinct and positive process steps in the order in which they are carried out such that it is clear as to the functional relationship of each step to all other steps.

In line 1 of claims 21 and 32 and where recited in any other claims "neo-cartilage" is uncertain as to meaning and scope. Being "neo" is relative and subjective, and it would be uncertain as to cartilage that is neo and not neo.

Applicants disagree. Since the new claims are also directed to the neo-cartilage, Applicants respectfully submit that the term is sufficiently defined in the specification as well as in the new claim 42.

In line 1 of claims 21 and 32 and where recited in any other claims, the meaning and scope of "*in situ* implantation" is unclear. How *in situ* defines the intended implantation is uncertain. The difference in implantation that is *in situ* and implantation that is not *in situ* is unclear.

Applicants disagree, however, this term is no longer used in the new claims.

Claim 21 in line 8 is unclear as to material suspended in the suspension fluid. Are the cells suspended in the fluid before being incorporated into the matrix, or is the matrix containing the incorporated cells suspended in the fluid?

This point is clarified by new claims where the claims clearly show that the activated cells are first suspended in the suspension fluid and then seeded into the support matrix using the suspension containing the cells.

In line 9 of claim 21 and where recited in other claims, the term "algorithm" is uncertain as to meaning and scope in the context used. The term is normally used mathematically, and not in a situation that is not mathematical as in the present claims.

Applicants disagree. However, to meet Examiner's rejections, the new claims do not use the term "algorithm" but rather claim the conditions disclosed as an "algorithm", as defined on page 15, lines 24-30.

In line 13 of claim 21, "non-pressure conditions" is uncertain as to meaning and scope. The specification fails to define conditions that are non-pressure.

Applicants disagree, however, the term is no longer used in the new claims.

In claims 21 and 32 (line 11), reciting "about zero to about 10 MPa" as the hydrostatic pressure is confusing since when the pressure is zero no hydrostatic pressure is required. The pressure should be omitted in the claims when the pressure can be zero, and required only when the pressure is not zero in a dependent claim. For the same type of reason reciting "zero to about 500 μL/min" is confusing by encompassing zero perfusion. Perfusion should be omitted when not required in claim 32, and required only when not zero in a dependent claim.

Applicants disagree. New claims utilize exact language used in the specification and eliminate the zero conditions. Thus Examiner's rejections are overcome.

Examiner argues that claims 21 and 32 are unclear as to whether the conditions of pressure, Hz, atmospheric pressure or non-pressure

conditions, time, oxygen percent, carbon dioxide percent, atmospheric or non-pressure conditions are all carried out together when hydrostatic pressure is cyclic or constant. If the pressure is constant, does "about 0.01 to about 2 Hz" apply?

Claims 21 and 32 are canceled, however, for Examiner's information, in this invention the hydrostatic pressure can be either constant or cyclic and both are run at frequency from 0.1 to 2 Hertz [page 40, section (a), lines 5-37 and Figures 4 and 5].

Claims 21 and 32 are unclear in the last two lines by reciting "about zero to about 20%" for oxygen concentration and "about zero to about 5%" for carbon dioxide concentration since the specification fails to disclose ranges for oxygen and carbon dioxide encompassing zero percent. The specification fails to define the composition of an atmosphere containing zero percent oxygen and/or carbon dioxide, and it would be uncertain as to an atmosphere composition when the oxygen and/or carbon dioxide content is zero.

Applicants disagree. However, Applicants provide the full support for the new claims 58 and 59 concerning this issue.

In claim 22 (lines 8 and 9), it is unclear how fibronectin, laminin, bioactive peptide, growth factor, cytokine form the matrix. These are not materials that normally form a matrix. In line 12 of claim 22, reciting "sol-gel" as a material is confusing since "sol-gel" describes how a material acts, and is not the material. In line 13 of claim 22, "a copolymer thereof" is unclear as to materials referred to as being a copolymer. Is copolymer thereof referring to all previous materials recited, or is only the "TRGH" recited immediately before copolymer thereof as the copolymer? Furthermore, materials recited before "copolymer thereof" are not materials that normally form a copolymer, and how the materials form a copolymer is unclear. Claim 34 is unclear for the same type of reasons as claim 22.

Applicants disagree. New claim 52 clarify this point. and groups the questioned compounds into clearly distinguishable groups of collagen containing questioned compounds.

Claim 23 is unclear as to whether the "hydrogel" is the "TRGH"

of claim 22 or some other hydrogel. There is not antecedent basis for a hydrogel other than TRGH.

Applicants disagree. However, the term is no longer used in the new claims. other than for thermo-reversible hydrogel.

Claims 23 and 38 are unclear as to physical structure that is a composite combination of materials as claimed. Additionally, in claim 38, reciting both "hydrogel" and "TRGH" is confusing Since there is not antecedent basis for a hydrogel that is not TRGH.

Applicants disagree. Claims 23 and 38 are canceled. New claims clarify this point.

Dependent claim 24 is unclear as to which part of the composite of claim 23 is TRGH. The specification does not disclose the entire composite being TRGH.

Applicants disagree. Specification, particularly page 32, lines 32-37 and page 33, lines 1-11, describe the function of TRGH as both the suspension fluid and, after being thermally converted to solid gel, as the support matrix. Page 14, lines 15-73, disclose the property of the TRGH meeting requirements of both the suspension fluid and the support matrix.

Dependent claim 25 is unclear how claim 24 is further limited since claim 24 depends ultimately on claim 21 that requires hydrostatic pressure to be cyclic or constant as in claim 25.

Claims 24 and 25 are canceled.

Claim 26 is confusing and unclear by requiring ranges having a lower limit of zero. If the lower limit is zero, nothing is required by the range. Claiming alternatives of nothing or something confuses and beclouds the invention. If the hours per day is zero as in line 4, there is no hydrostatic pressure as required in line 1, and the claim does not further limit claim 25. Furthermore, when the hours and days for static atmospheric pressure are zero, there is no static pressure. Claiming the pressure when not required confuses metes and bounds of the invention. Additionally, hydrostatic pressure in claim 21 can be zero, and claiming zero hydrostatic pressure again in a claim dependent on claim 21 further leads to confusion.

Applicants disagree, however, to meet Examiner's rejections, claim 26 is canceled.

Claim 27 is unclear by depending on claim 26 and requiring a range of hydrostatic pressure since in claim 26 the pressure can be for zero hours, which does not require hydrostatic pressure. Requiring zero constant pressure in line 3 of claim 27 is confusing for reasons set forth above to regard to reciting ranges encompassing zero. Furthermore, is unclear in claim 27 where an alternative of constant pressure is used. Is constant pressure the non-pressure conditions in claim 21?

Applicants disagree. However, they canceled claim 27.

Claim 28 is unclear how hydrostatic pressure in claim 26 can be preceded or followed by atmospheric pressure when the hydrostatic pressure in claim 26 is zero hours per day.

Applicants disagree. Claim 28 is canceled.

Claim 31 is unclear how the matrix being perfused with a medium changes the construct from that required by claim 28. If the construct is not changed by being perfused with the medium, claim 31 does not further limit claim 28 and is an improper dependent claim.

Applicants disagree, however, the new claims clarify this point as the perfusion step is included in the independent claim 43 and further in dependent claims 61 and 62.

Claim 32 is unclear by reciting ranges encompassing zero for reasons set forth above. The claim is further unclear by requiring the chondrocytes or cells to be suspended in a suspension fluid and then propagated within the support matrix without a step of incorporation of the chondrocytes or cells in the matrix after being suspended in the suspension fluid in line 6. The claim is further unclear as to the meaning and scope of "using an algorithm of the 5 invention" (line 8).

Applicants disagree. The rejected conditions and terms are no longer used in the new claims.

Claim 33 is unclear by requiring a range of "density from below to 3 about 12". This range encompasses zero density. The claim is

further unclear as to whether the chondroctyes or cells are suspended in the suspension fluid when incorporated in the matrix.

Applicants disagree. However, the density conditions are no longer claimed.

As set forth above, "sol-gel" in claims 35 and 37 is not a material from which the matrix can be prepared.

Applicants disagree. Similarly to the TRGH, sol-gel is a transitional material depending on the temperature used and thus it can be both the suspension fluid in the sol stage and the support matrix in the solid gel stage (page 31, lines 1-9).

Claim 36 is unclear as to the physical form of the matrix before being freeze-dried or lyophilized since steps of preparing the matrix are not set forth. Additionally, the difference in steps that result in being freeze-dried as compared to being lyophilized, and the difference in structure that results from being freeze-dried as compared to being lyophilized is uncertain.

Applicants disagree. The claim 36 are canceled.

Dependent claim 37, which is dependent on claim 36, is unclear as to the relationship of matrix structure of claim 37 to the matrix structure of claim 36, and how the matrix structure of claim 37 further limits the matrix structure of claim 36.

Applicants disagree, however, the claims 36 and 37 are canceled.

Claim 39 is unclear how a gel, sol-gel or TRGH can be a suspension fluid for the chondrocytes since a gel, sol-gel or TRGH is not a fluid. Additionally, claim 39 ultimately depends on claim 33 that requires chondrocytes or cells. There is not antecedent basis for cells, only for chondrocytes.

Applicants disagree. The sol-gel and TRGH properties are explained above. The term "cells" is canceled from the claims.

In claim 40, TRGH is not fluid in which the chondrocytes or cells can be suspended as required. A gel is not a fluid.

Applicants disagree. The TRGH is sol/gel transitional thermally dependent material that in the sol form is the fluidic material in which the chondrocytes can be suspended.

It is respectfully submitted that the new claims take in consideration all Examiner rejections under 35 U.S.C. 112, second paragraph. It is believed that the new claims overcome all these rejections.

Rejections Under 35 USC § 102

Claims 21, 22 and 32-35 are rejected under 35 U.S.C. 102(a) as 15 being anticipated by Smith et al (6,528,052 81).

The claims are drawn to a neo-cartilage construct for in situ implantation into a cartilage lesion. The construct comprises chondrocytes or cells that can be differentiated into chondrocytes and a support matrix. The chondrocytes or cells are incorporated into the support matrix suspended in a suspension fluid and propagated within the matrix. During propagating, the matrix containing the chondrocytes or cells can be subjected to cyclic or constant hydrostatic pressure, to atmospheric pressure or non-pressure conditions, at an oxygen concentration of 0-20% and a carbon dioxide concentration of 0-5%. The hydrostatic pressure can be preceded or followed by a period of static atmospheric pressure at an oxygen concentration of 1-20%. The construct can be three-dimensional.

Smith et al disclose repair and regeneration of cartilage by a process that involves *in vivo*, *ex vivo* or *in vitro* treatment of cartilage or cartilage cells by using treatment conditions of intermittent application of periods of hydrostatic pressure followed by periods of recovery *in situ* (col 4, lines 25-31, and col 7, line 30 to col 8, line 8). The recovery period can be at atmospheric or low constant pressure (col 7, lines 48-50). In vitro treatment is performed by obtaining cartilage cells from cartilage, and applying treatment conditions while culturing the cartilage cells in suspension within a scaffold/support, and implanting the resultant tissue or cells into a patient (col 9, lines 23-30, and col II, lines 5-9).

Regenerating cartilage as disclosed by Smith et al results in a neo-cartilage construct for *in situ* implantation that is the same as produced as presently claimed. Smith et al disclose using a

hydrostatic pressure and frequency of applying the pressure that are the same as may be used in the present claims. Air as an atmosphere in Smith et al will provide an oxygen content and carbon dioxide content within the ranges that may be used as presently claimed. No condition and/or step is seen in the present claims that is sufficiently different than used by Smith et al to result in a materially different construct.

The presently claimed invention is not disclosed in parent application 10/104,677, and the parent application cannot be relied on for a priority date earlier than the filing date the present application.

Applicants disagree. The Smith reference does not utilize neo-cartilage construct. The neo-cartilage construct is prepared from mature non-dividing metabolically inactive chondrocytes that have been treated according to the invention (isolated from the cartilage, extracellular matrix removed and expanded) to rejuvenate them to act as immature, dividing chondrocytes that synthesize the extracelluar matrix. The adult mature chondrocytes do not synthesize the extracellular matrix. That is the reason why the cartilage is, by itself unable to repair or regenerate into the normal hyaline cartilage.

The adult cartilage is not vascularized and contains only very limited number of chondrocytes as determined by the ratio 95:5% of the extracellular matrix and chondrocytes. Neo-cartilage, that is the support matrix as described in the specification seeded with activated chondrocytes, on the other hand, has much higher number of chondrocytes and these chondrocytes are able to actively synthesize the new extracellular matrix and thus produce new hyaline cartilage that has the same properties as the immature hyaline cartilage.

The Smith reference nowhere discloses a concept of the neo-cartilage, it merely deals with repair or regeneration of the damaged, diseased or injured cartilage.

It is respectfully submitted that Smith does not anticipate the current invention as it does not disclose a production of the neo-

cartilage construct comprising an immature hyaline cartilage derived from isolated and activated chondrocytes.

Rejection is overcome and should be withdrawn.

Claim Rejections Under 35 use § 103

This application currently names joint inventors.

In considering patentability of the claims under 35 U.S.C. 103 (a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U. S . C. 103 (a).

Inventorship remains the same.

Claims 21-23 and 32-35 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Smith et al (6,528,052 81) in view of Lee et al (6,306,169 B1).

The invention and Smith et al are described above.

Examiner argues that the procedure used by Smith et al to produce a cartilage construct is the same as presently claimed except that Smith et al may not disclose providing the cells suspended in a suspension fluid prior to being incorporated in the matrix, and that Lee et al disclose producing an implant containing cells such as chondrocytes (col 7, line 8) by isolating the cells from tissue, proliferating the cells and seeding the cells in a construct (col 7, lines 13-17) such as a collagen sponge (col 12, line 17). A collagen sponge can be infiltrated with an alginate or agarose solution containing the cells, and the alginate or agarose gelled within the sponge (col 13, lines 11-25). This procedure produces a construct having mechanical function that resembles that processed by tissue to be repaired (col 4, lines 28-37).

Examiner concludes that when incorporating cells in a scaffold for treatment as disclosed by Smith et al, it would have been obvious to use a collagen sponge as the scaffold and incorporate the

cells into the sponge while the cells are suspended on an alginate or agarose solution as disclosed by Lee et al to obtain a mechanical function resembling that of tissue being repaired. The conditions of dependent claims would have been obvious from conditions disclosed by Smith et al and/or Lee et al.

Applicants disagree. As discussed above, the Smith reference does not deal with immature hyaline cartilage and neither does the Lee reference. Neither reference recognizes the ability of the mature chondrocytes to be activate into acting as young immature chondrocytes synthesizing the new extracellular matrix in response to the treatment according to the invention.

While Lee prepares the implant including two matrix components, one composed of collagen and the second being hydrated alginate gel that fills the porous structure of the first component, into which the various cell may be incorporated and the implant then is implanted into the damaged cartilage or other tissue, such implant is not functionally able to produce new extracellular matrix. It merely, similarly to the Smith reference, provides means for repair or regeneration of the injured cartilage without providing chondrocytes that are rejuvenated to produce the new extracellular matrix similar to production of the cartilage seen in the juvenile individuals where the chondrocytes are fully metabolically active and produce the amount of extracellular matrix needed for formation of the new cartilage.

New claims 43-62 are not obvious over Smith in view of Lee. The combination of these two references would not derive the current neo-cartilage construct comprising rejuvenated chondrocytes synthesizing the new cartilage having the similar properties as the young cartilage.

The rejection should be withdrawn and the claims allowed to issue. It is so respectfully requested.

Claim Rejections Under 35 USC § 103

Claims 24-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claims 21-23 and 32-35 above, and further in view of Burg (6,991,652 B2).

Examiner submits that the claims require the support matrix to be prepared from TRGH (thermo-reversible gelation hydrogel). Burg discloses forming a hydrogel-cell composition for use in forming new tissue such as cartilage. Temperature-dependent hydrogels can be used (paragraph bridging cols 5 and 6). The hydrogels have reverse gelation properties, and are liquids at or below room temperature, and gel when warmed to higher temperatures, e.g. body temperature.

When using a collagen sponge containing gelled alginate or agarose containing cells as the scaffold of Smith et al as set forth above, it would have been obvious to replace the alginate or agarose with a temperature-dependent hydrogel to obtain its reverse gelation properties disclosed by Burg of being liquid at room temperature and gelling by warming. This property would have been an obvious advantage for incorporating the hydrogel In a collagen sponge.

Again, Applicants disagree. Burg reference does not add anything new to the two other cited references. The current invention and claims utilize the thermo-reversible gelation hydrogel either as a suspension solution for activated isolated chondrocytes or as the support matrix, or both. The final product is the neo-cartilage, the immature hyaline cartilage. Such cartilage is not prepared by either Smith, Lee or Burg, regardless of combinations made of their references.

Rejection should be withdrawn. It is respectfully requested that the claims be allowed and the Notice of Allowance be issued.

Rejections Under 35 USC § 103

Claims 36-42 are rejected under 35 D.S.C. 103(a) as being unpatentable over the references as applied to claims 21-23 and 32-35 above, and further in view of Atkinson et al (6,511,958 Bl).

The claims require the support matrix to be prepared from type I, II or IV collagen and freeze-dried or lyophilized into a collagen sponge, porous scaffold or honeycomb.

Atkinson et al disclose a cartilage repair matrix formed of a sponge (col 34, line 17). The sponge can be formed by using type I collagen and lyophilizing (col 45, lines 27-39, and col 55, lines 31- 42).

When using a collagen sponge containing gelled alginate or agarose containing cells as the scaffold of Smith et al as set forth above, it would have been obvious form the collagen sponge using type I collagen and lyophilizing as suggested by Atkinson et al.

Applicants disagree. Claims to lyophilized support matrix are canceled. The rejection is moot and should be withdrawn.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the ~right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 15 686 F.2d 937,214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438,164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. Effective January I, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 21-42 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims

1-30 16 of U.S. Patent No. 6,949,252 B2. Although the conflicting claims are not identical" they are not patentably distinct from each other because the claimed construct for implanting in a cartilage lesion would have been obvious from the method claimed by the patent for producing a construct for treatment of a lesion of joint cartilage.

Applicants disagree, however to advance examination, fully executed Terminal Disclaimer is submitted herewith.

Double Patenting

Claims 21-23 and 32-35 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-28 or 10-29 or 1-20 of copending Application No. 10/626,459 or 11/413,419 or 10/625,822 1 respectively, in view of Lee et all and if necessary in further view of Smith et al.

When preparing a neo-cartilage construct as required by the claims of the applications, it would have been obvious to use a collagen sponge as the scaffold and incorporate the cells into the sponge while the cells are suspended on an alginate or agarose solution as disclosed by Lee et al to obtain a mechanical function resembling that of tissue being repaired. If needed, Smith et al would have further suggested conditions for preparing the construct.

This is a provisional obviousness-type double patenting rejection.

Applicants disagree, however submit fully executed Terminal Disclaimer.

Double Patenting

Claims 24-31 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over the claims of the applications in view of Lee et all and if needed Smith et all as applied to claims 21-23 and 32-35 above, and in further view of Burg.

When using a collagen sponge containing gelled alginate or agarose containing' cells as the scaffold of the claims of the applications as set forth above, it would have been obvious to

replace the alginate or agarose with a temperature-dependent hydrogel to obtain its reverse gelation properties as disclosed by Burg of being liquid at room temperature and gelling by warming. This property would have been an obvious advantage for incorporating the hydrogel in the collagen sponge.

The rejected claims are canceled.

Double Patenting

Claims 36-42 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over the claims of the applications in view of Lee et al, and if needed Smith et al, as applied to claims 21-23 and 32-35 above, and in further view of Atkinson et al. When using a collagen sponge containing gelled alginate or agarose containing cells as the scaffold of the claims of the applications as set forth above, it would have been obvious form the collagen sponge using type I collagen and lyophilizing as suggested by Atkinson et al.

Rejected claims are canceled.

SUMMARY

In summary, Applicants canceled all prior claims 21-42 and submit herewith the new claims 43-62. Arguments are provided to overcome the prior rejections under 35 U.S.C. 102 and 103. Executed Terminal Disclaimers are submitted to overcome Double Patenting rejections.

Respectfully submitted,

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